

Unit 1 Technology: Investigating Square Roots with a Calculator, page 29

1. a) 21 b) 4.36; Approximation
c) 7.94; Approximation d) 23

Unit 1 Mid-Unit Review, page 30

1. 100
2. a) 4 b) 7 c) 14 d) 20
3. a) 121 b) 8 c) 13 d) 15
4. a) i) $A = 16 \text{ cm}^2$ ii) $s = \sqrt{16} \text{ cm}$
b) i) $A = 36 \text{ cm}^2$ ii) $s = \sqrt{36} \text{ cm}$
5. a) 1, 2, 3, 4, 6, 8, 9, 12, 18, 24, 27, 36, 54, 72, 108, 216; Not a square number since even number of factors.
b) 1, 2, 4, 7, 13, 14, 26, 28, 52, 91, 182, 364; Not a square number since even number of factors
c) 1, 3, 9, 27, 81, 243, 729; Square number since odd number of factors; $\sqrt{729} = 27$

6. Let the square number represent the area of a square, then its square root is the side length.

7. a) $\sqrt{24}$; 24 is not a square number.
b) 81 cm^2

8. a) 72 cm^2 b) $\sqrt{72} \text{ cm}$ c) 8.5 cm

9. a) 12 b) 34
10. a) 1 and 2 b) 8 and 9
c) 8 and 9 d) 7 and 8

11. a) 4.12 b) 10.39 c) 5.74 d) 8.89

1.5 The Pythagorean Theorem, page 34

3. a) 50 cm^2 b) 52 cm^2
4. a) 64 cm^2 b) 28 cm^2
5. a) 10 cm b) 13 cm c) 4.5 cm d) 5.8 cm
6. a) 9 cm b) 24 cm c) 9.8 cm d) 6.7 cm
7. a) 7.6 cm b) 20 cm c) 20 cm
8. a) 8.06 cm b) 11.66 cm c) 25 cm
9. a) 5 cm b) 10 cm c) 15 cm

Compared to rectangle a, the lengths are two times greater in rectangle b and three times greater in rectangle c. The next rectangle has dimensions 12 cm by 16 cm and diagonal 20 cm.

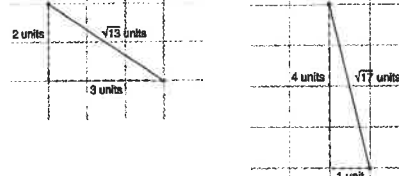
10. The longest side is the hypotenuse.
11. The two right triangles formed by the diagonals both have legs 12 cm and 16 cm. So the diagonals must be the same length.
12. 1 and $\sqrt{17}$, $\sqrt{2}$ and 4, $\sqrt{3}$ and $\sqrt{15}$, 2 and $\sqrt{14}$, $\sqrt{5}$ and $\sqrt{13}$, $\sqrt{6}$ and $\sqrt{12}$, $\sqrt{7}$ and $\sqrt{11}$, $\sqrt{8}$ and $\sqrt{10}$, 3 and 3

For each answer, the sum of the squares is 18.

13. a) 6 units b) 8 units c) 4 units
14. a) b)



c) d)



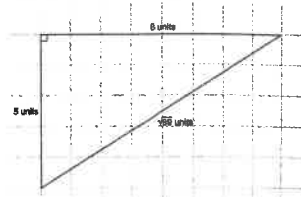
15. $15^2 = 12^2 + 9^2$; Length of legs: 12 cm and 9 cm
16. 3.535 cm^2 , 6.283 cm^2 , 9.817 cm^2

The sum of the areas of the semicircles on the legs is equal to the area of the semicircle on the hypotenuse.

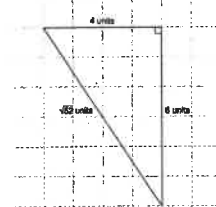
17. a)



b)



c)



18. a) $\sqrt{2} \text{ cm}$, $\sqrt{3} \text{ cm}$, $\sqrt{4} \text{ cm}$, $\sqrt{5} \text{ cm}$, $\sqrt{6} \text{ cm}$, $\sqrt{7} \text{ cm}$

b) 1.4, 1.7, 2.0, 2.2, 2.4, 2.6

c) 1.4 cm, 1.7 cm, 2.0 cm, 2.2 cm, 2.4 cm, 2.6 cm

d) The lengths of the hypotenuses are the square roots of consecutive whole numbers.

1.6 Exploring the Pythagorean Theorem, page 43

3. a) Yes; $38 + 25 = 63$ b) No; $38 + 25 \neq 60$
4. a) No; $10^2 + 1^2 \neq 13^2$ b) No; $7^2 + 5^2 \neq 8^2$
c) Yes; $15^2 + 8^2 = 17^2$

5. No, since it is not a right triangle

6. a) Yes b) No c) Yes d) Yes
e) No f) No g) No h) Yes

7. a, c, d, f

8. Yes, it is a right angle since $9^2 + 12^2 = 15^2$.

9. Yes, the triangle is a right triangle;

$$7^2 = 6^2 + (\sqrt{13})^2$$

No, the side lengths do not form a Pythagorean triple since $\sqrt{13}$ is not a whole number.

10. $3^2 + 5^2 \neq 7^2$; Not a right triangle

11. a) Legs: 3, 4; 6, 8; 9, 12; 12, 16; 15, 20
Hypotenuse: 5; 10; 15; 20; 25

b) All triples are multiples of first triple 3, 4, 5.

c) 10, 24, 26; 15, 36, 39; 20, 48, 52; 25, 60, 65

12. a) 50, since $14^2 + 48^2 = 50^2$